

CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A biopsy device for tissue collection, comprising:
a housing containing a power source; and
a removable element, comprising a biopsy needle module and a pressure source, wherein the removable element is configured for integration into the housing;
wherein the biopsy device can be held in a single hand of a physician, having no cables or lines extending from the housing to external units.
2. The biopsy device according to claim 1, wherein the biopsy needle module comprises a biopsy needle and a cutting sleeve, the biopsy needle comprising a sharpened distal end and a distal opening for collection of tissue, the cutting sleeve having a cutting blade on the distal end thereof and being coaxially positioned with respect to the biopsy needle.
3. The biopsy device according to claim 2, wherein the pressure source comprises a vacuum pressure-generating device having a piston/cylinder arrangement, the vacuum pressure-generating device being connected to a proximal end of the biopsy needle via a connecting element, forming an airtight connection therewith.
4. The biopsy device according to claim 2, further comprising a clamping carriage contained within the housing.

5. The biopsy device according to claim 4, wherein the biopsy needle module can be connected to the clamping carriage such that the biopsy needle module is longitudinally displaceable by the clamping carriage.

6. The biopsy device according to claim 5, further comprising a first and second drive unit contained within the housing.

7. The biopsy device according to claim 6, wherein the clamping carriage is connected to the first drive unit.

8. The biopsy device according to claim 7, wherein the cutting sleeve is connected to the first drive unit, the cutting sleeve being axially movable relative to the biopsy needle.

9. The biopsy device according to claim 1, wherein the power source comprises at least one battery.

10. The biopsy device according to claim 1, wherein the housing comprises a lower housing segment with lateral walls of different heights, a housing lid matched to the lower housing segment and having a longitudinally displaceable locking mechanism, and a first and second end lid, each connected to the lower housing segment.

11. The biopsy device according to claim 10, wherein the first housing lid comprises a U-shaped opening at the top thereof, the opening sized to receive a portion of the removable element.

12. The biopsy device according to claim 11, wherein the second housing lid comprises a first and second U-shape opening at the top thereof, wherein each of said opening is sized to receive a portion of the removable element.

13. The biopsy device according to claim 1, further comprising a control panel attached to the housing, wherein the control panel is connected to the power source.

14. The biopsy device according to claim 13, wherein the control panel is connected to a circuit board.

15. The biopsy device according to claim 14, wherein the circuit board has a programmable microprocessor disposed thereon.

16. The biopsy device according to claim 14, wherein the control panel comprises a control key for actuating a clamping cradle, a program key for actuating a tissue sampling procedure and a clamping key for triggering clamping of the clamping cradle.

17. The biopsy device according to claim 16, wherein the program key is positioned between the control key and clamping key to avoid accidental actuation of the clamping cradle.

18. The biopsy device according to claim 16, wherein each of the keys have a light associated therewith that indicates whether the key is active.

19. The biopsy device according to claim 16, wherein the clamping key is equipped with a delay circuit to prevent inadvertent pressing thereof.

20. The biopsy device according to claim 4, wherein a locking mechanism is contained within the housing to lock the clamping cradle, the locking mechanism comprising a handle having an arm, wherein the arm locks into a depression in the clamping cradle.

21. The biopsy device according to claim 20, wherein the clamping cradle is comprised of a plastic material and the handle is comprised of a metal material, wherein a metal part is positioned within the depression.

22. The biopsy device according to claim 20, wherein actuation of the clamping cradle causes the biopsy needle to penetrate into a patient a predetermined distance.

23. The biopsy device according to claim 22, wherein the clamping cradle can be set to penetrate at a plurality of distances.

24. The biopsy device according to claim 23, wherein the clamping cradle can be set to penetrate a distance which is in the range between approximately 15 mm and 25 mm.

25. A biopsy device for tissue collection, comprising:
a housing containing a power source; and
a removable element configured for integration into the housing,
comprising:
a biopsy needle module comprising a biopsy needle and a
cutting sleeve, the biopsy needle comprising a
sharpened distal end and a distal opening for
collection of tissue, the cutting sleeve having a
cutting blade on the distal end thereof and being
coaxially positioned with respect to the biopsy
needle, and
a pressure source comprising a vacuum pressure-generating
device having a piston/cylinder arrangement, the
vacuum pressure-generating device being connected
to a proximal end of the biopsy needle via a
connecting element, forming an airtight connection
therewith,
wherein the biopsy device can be held in a single hand of a
physician, having no cables or lines extending from the
housing to external units.

26. The biopsy device according to claim 25, further comprising a
clamping carriage contained within the housing.

27. The biopsy device according to claim 26, wherein the biopsy
needle module can be connected to the clamping carriage such that the biopsy needle
module is longitudinally displaceable by the clamping carriage.

28. The biopsy device according to claim 27, further comprising a first and second drive unit contained within the housing.

29. The biopsy device according to claim 28, wherein the clamping carriage is connected to the first drive unit.

30. The biopsy device according to claim 29, wherein the cutting sleeve is connected to the first drive unit, the cutting sleeve being axially movable relative to the biopsy needle.

31. The biopsy device according to claim 26, wherein a locking mechanism is contained within the housing to lock the clamping cradle, the locking mechanism comprising a handle having an arm, wherein the arm locks into a depression in the clamping cradle.

32. The biopsy device according to claim 31, wherein the clamping cradle is comprised of a plastic material and the handle is comprised of a metal material, wherein a metal part is positioned within the depression.

33. The biopsy device according to claim 31, wherein actuation of the clamping cradle causes the biopsy needle to penetrate into a patient a predetermined distance.

34. The biopsy device according to claim 33, wherein the clamping cradle can be set to penetrate at a plurality of distances.

35. The biopsy device according to claim 34, wherein the clamping cradle can be set to penetrate a distance which is in the range between approximately 15 mm and 25 mm.

36. A biopsy device for tissue collection, comprising:
a housing containing a power source and a circuit board;
a control panel attached to the housing, wherein the control panel
is connected to the power source and the circuit board; and
a removable element, comprising a biopsy needle module and a
pressure source, wherein the removable element is
configured for integration into the housing;
wherein the biopsy device can be held in a single hand of a
physician, having no cables or lines extending from the
housing to external units.

37. The biopsy device according to claim 36, wherein the circuit board
has a programmable microprocessor disposed thereon.

38. The biopsy device according to claim 36, wherein the control panel
comprises a control key for actuating a clamping cradle, a program key for actuating a
tissue sampling procedure and a clamping key for triggering clamping of the clamping
cradle.

39. The biopsy device according to claim 38, wherein the program key
is positioned between the control key and clamping key to avoid accidental actuation of
the clamping cradle.

40. The biopsy device according to claim 38, wherein each of the keys
have a light associated therewith that indicates whether the key is active.

41. The biopsy device according to claim 38, wherein the clamping
key is equipped with a delay circuit to prevent inadvertent pressing thereof.

42. A biopsy device for tissue collection, comprising:
- a housing containing a power source, wherein the housing comprises a lower housing segment with lateral walls of different heights, a housing lid matched to the lower housing segment and having a longitudinally displaceable locking mechanism, and a first and second end lid, each connected to the lower housing segment; and
 - a removable element, comprising a biopsy needle module and a pressure source, wherein the removable element is configured for integration into the housing;
- wherein the biopsy device can be held in a single hand of a physician, having no cables or lines extending from the housing to external units.

43. The biopsy device according to claim 42, wherein the first housing lid comprises a U-shaped opening at the top thereof, the opening sized to receive a portion of the removable element.

44. The biopsy device according to claim 43, wherein the second housing lid comprises a first and second U-shape opening at the top thereof, wherein each of said opening is sized to receive a portion of the removable element.